

AUTOMATIC REVERSAL DEVICE FOR DIGITAL COPYING MACHINE

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EC Classification:

Equivalents:

Abstract

PURPOSE: To shorten a selecting time and improve the workability by causing a trailing paper sheet to wait at a resist section for a necessary time, depending upon the size of a memorized leading paper sheet, when the leading paper sheet is delivered after reversal and the trailing paper sheet is normally delivered.

CONSTITUTION: A paper sheet transfer mechanism operates in such a way that a transfer paper sheet is taken out on the rotation of a feed roller 2, and caused to pass through a photoreceptor 4 and a fixing roller 7 on the rotation of a resist roller 3, upon receipt of request about image transfer. Then, the sheet is delivered in normal state to a stacking tray 12 via a delivery roller 11. In delivering a paper sheet in reversal state, a reversal selector claw 8 is actuated and a transfer paper sheet is temporarily introduced to a reversal stocker 10. Thereafter, a reversal roller 9 is reversed to deliver the sheet to the delivery roller 11 and, then, operation migrates to judgement and sheet delivery control mode. In this case, a control device operates to keep a paper sheet at the section of the resist roller 3 for a necessary time, depending upon the size of a memorized leading paper sheet, when the leading paper sheet is delivered in reversal state and a trailing paper sheet is delivered in normal state.

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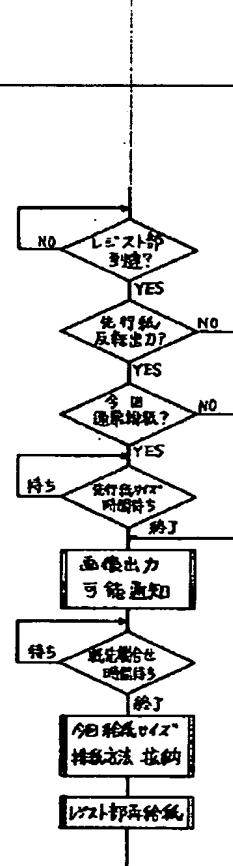
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(54)【発明の名称】 デジタル複写機の自動反転装置

(57)【要約】

【目的】 自動反転機能付デジタル複写機において、反転排紙から通常排紙への切り換えを最短時間で行う。

【構成】 先行紙の排紙面を記憶する手段を設ける。紙サイズを検知する手段を有する。先行紙の紙サイズを記憶する手段を設ける。先行紙が反転排紙で後行紙が通常排紙の場合に、記憶された先行紙の紙サイズに応じて、後行紙をレジスト部で待機させる。



【特許請求の範囲】

【請求項1】 印刷された紙を、表面、裏面に選択排紙できるようにしてあるデジタル複写機の自動反転装置において、1枚前に排紙される紙の面を記憶する手段と、予め紙サイズを検知する手段と、1枚前の紙サイズを記憶する手段とを有し、1枚前が反転排紙で次が反転無し排紙のときに、記憶された1枚前の紙サイズに応じて次に排紙する紙をレジスト部で必要時間保持させる機能をもたせたことを特徴とするデジタル複写機の自動反転装置。

【請求項2】 紙の後端がレジスト部を通過してからの経過時間を計測する手段を設け、次に排紙する紙を、1枚前の紙のレジスト部通過経過時間と記憶された紙サイズとの差分だけレジスト部で待機させる機能をもたせた請求項1記載のデジタル複写機の自動反転装置。

【請求項3】 紙がレジスト部を通過する時間を計測する手段と、計測された時間を保持する手段とを設け、予め長さを検知できない紙がレジスト部に到達したとき、前の紙の排紙面と上記紙のレジスト部通過時間と通過経過時間によってレジスト部で待機する時間を制御する機能をもたせた請求項2記載のデジタル複写機の自動反転装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明はデジタル複写機の自動反転装置に関するものである。

【0002】

【従来の技術】 自動反転機能を有する複写機では、操作モードによって反転／反転無し排紙が決定されるものであり、その決定は、自動原稿送り装置（ADF）が原稿反転機能付（RADF）であるか、原稿の送り順がどのように設計されているかによって異なるが、一般的に、排紙された紙の順番が原稿の順番と同じになるように排紙されることが必要となる。

【0003】 又、レーザービームプリンター（LBP）では、最初に出力される順番にしたがって排紙が積まれるのが一般的であるため、裏面排紙が必要であるが、排紙を表面にするか、裏面にするかは、メカ機構をユーザーが切り換えることによって対応すれば自動反転機能は必要ないので、実際上、ほとんどのプリンターはメカ方式で切り換えを行っている。

【0004】 一方、デジタル複写機では、プリンターを一体に組み合わせた型式が出現してきており、この場合、複写機としての出力は表面排紙が一般的であり、プリンター機能に切り換えた場合は一般的な裏面排紙を選択できるように、自動反転排紙装置を用意している。

【0005】 しかし、従来のデジタル複写機において、複写モードからプリンターモードに切り換えた場合、複写モードでの一連の動作で区切りが付いた（たとえば、排紙完了）時点でプリンターモードに入るため、切り換

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え時間が長く、生産性が極端に低下してしまう。

【0006】 詳述すると、図4は一般的な自動反転機能付デジタル複写機の給紙搬送機構の一例を示すもので、1は転写紙カセット、2は給紙コロ、3はレジストローラー、4は感光体、5はポリゴン書込部6による露光点、7は定着ローラー、8は反転切り換え爪、9は反転ローラー、10は反転ストッカー、11は排紙ローラー、12は排紙受皿、13は手差し用給紙コロである。又、上記各レジストローラー3、定着ローラー7、排紙ローラー11には、それぞれ紙搬送を制御するためレジストセンサー、定着センサー、排紙センサーを備えている。

【0007】 先ず、給紙ローラー2を回転することにより転写紙が1枚給紙され、レジストローラー3に到達したことをレジストセンサーで検知し、ここで一旦レジストローラー3を停止し、紙を待機させる。次に、画像信号要求を出すと、露光点5に画像を形成するための信号が入力され、露光点から転写点までの距離とレジストローラー3から転写点までの距離の差だけ、レジストローラー3に紙を待たせてからレジストローラー再スタートを行う。これにより、紙の先端と画像先端を一致させる。次いで、給紙が可能となるタイミングは、紙サイズ機械のレイアウト等で変化するが、最低数十mm以上の間隔をおかないとジャム検知ができないため、この間隔を紙間L₁ (mm)と呼ぶ。

【0008】 今、自動反転機において、通常排紙する場合は、図5に示すように、紙Pはそのまま搬送されるので、前述の紙間があればよい。

【0009】 一方、反転排紙する場合は、まず、図6の（イ）に示すように、反転切り換え爪8により紙Pの搬送パスを変え、反転ストッカー10に紙Pを導く。このとき、紙搬送は定着ローラー7が行っており、図6の（ロ）に示すように、定着ローラー7を紙Pが抜ける直前に反転ローラー9に紙搬送を行わせるよう制御する。次に、紙Pが定着ローラー7を完全に抜けた時点で、図6の（ハ）に示すように、反転ローラー9を逆回転させ、反転切り換え爪8により排紙ローラー11の方向へ紙Pを導く。続いて、図6の（ニ）に示すように、先行紙Pの先端が排紙ローラー11に到達した後は、排紙ローラー11が先行紙Pの搬送を行うため、反転ローラーでの搬送駆動を解除することができ、次の紙Pの反転排紙制御へ移行することができる。

【0010】 ここで、連続反転する場合の紙間L₂を考えると、図6の（ロ）～（ニ）の工程に必要な距離となる。すなわち、先行紙Pの後端が定着ローラー7を通過し反転ローラー9が先行紙の搬送を行い、回転方向を切り換えて排紙ローラー11に先行紙の先端を到達させるまでの時間×紙搬送速度=L₂である。

【0011】 一般的には、前述のL₁とL₂が等しくなるようにメカ機構を設計するために、連続で通常排紙、

反転排紙する場合は紙間は一定制御すればよかった。したがって、従来は、通常排紙が全て終了してから反転排紙に切り換えていた。又、逆も同じである。

【0012】

【発明が解決しようとする課題】ところが、デジタル複写機にプリンター機能を組み合わせて動作させた場合、従来の方式では、排紙を切り換える毎に無駄な時間が生じてしまうため、生産性が低下していた。

【0013】反転機の動作をよく考えると、先行紙と今回レジスト部に待機した紙（以下後行紙）の排紙方法が同じである場合は、通常の紙間 $L_1 = L_2$ でよいことは前述した。一般にこの紙間は、レジストローラーに到達する前の給紙制御段階で行われているため、通常のレジスト処理はあくまで前述の紙先端合わせ処理を行えばよい。又、通常排紙から反転排紙に切り換える場合も同様に特別な処理は必要ない。問題となるのは、反転排紙から通常排紙に切り換えた場合で、この場合、最低紙間 $L_1 = L_2$ で紙が搬送されると、先行紙が反転処理中に後行紙が反転機に入り込むためジャムが発生してしまう。

【0014】そこで、本発明は、レジスト部での待機時間を制御することにより、切り換えるための無駄な時間を最小にすると共に、先行紙と後行紙のジャムをなくすことができるようしようとするものである。

【0015】

【課題を解決するための手段】本発明は、上記課題を解決するために、印刷された紙を、表面、裏面に選択排紙できるようにしてあるデジタル複写機の自動反転装置において、1枚前に排紙される紙の面を記憶する手段と、予め紙サイズを検知する手段と、1枚前の紙サイズを記憶する手段とを有し、1枚前が反転排紙で次が反転無し排紙のときに、記憶された1枚前の紙サイズに応じて次に排紙する紙をレジスト部で必要時間保持させる機能をもたせた構成とする。

【0016】又、紙の後端がレジスト部を通過してからの経過時間を計測する手段を設け、次に排紙する紙を、1枚前の紙のレジスト部通過経過時間と記憶された紙サイズとの差分だけレジスト部で待機させる機能をもたせた構成とする。

【0017】更に、紙がレジスト部を通過する時間を計測する手段と、計測された時間を保持する手段とを設け、予め長さを検知できない紙がレジスト部に到達したとき、前の紙の排紙面と上記紙のレジスト部通過時間と通過経過時間によってレジスト部で待機する時間を制御する機能をもたせた構成とするのがよい。

【0018】

【作用】先行紙が反転排紙で後行紙が通常排紙の場合、記憶された先行紙の紙サイズに応じて後行紙がレジスト部で必要時間待機せられる。

【0019】又、後行紙のレジスト部到達が遅い場合は、後行紙を、先行紙のレジスト部通過時間と記憶され

た紙サイズとの差分だけ、レジスト部で待機させることができるようになる。

【0020】更に、手差し給紙のように、長さ検知できない紙がレジスト部に到達したときは、先行紙の排紙面と紙のレジスト部通過時間と通過経過時間によって後行紙をレジスト部で待機させることができる。

【0021】

【実施例】以下、本発明の実施例を図面を参照して説明する。図1は本発明の一実施例を示すもので、図4乃至図7に示すデジタル複写機と同様な構成において、1枚前に排紙される紙の面を記憶する手段と、予め紙サイズを検知する手段と、1枚前の紙サイズを記憶する手段とを有し、1枚前が反転排紙で次が反転無し排紙のときに、記憶された1枚前の紙サイズに応じて次に排紙する紙をレジスト部で最小紙間 L_3 だけ待機させる機能をもたせたものである。

【0022】詳述すると、図6の（ロ）～（ニ）より紙間 L_2 が決定されたが、反転排紙後、後行紙がジャムを起すことなく反転機に到達するのに最も早いタイミングは、図7の（ロ）に示すように、先行紙Pの後端が排紙ローラー11を通過する直前、又は直後に後行紙P'の先端が定着ローラー7に到達するようなタイミングである。一方、図6の（ニ）と図7の（ロ）での差 $L_3 - L_2$ は、ほぼ紙の長さであることがわかる。もちろんメカのレイアウトによって多少の差がでることは当然であるが、これらの誤差は説明に直接関係しないため、代表値として $L_3 - L_2 =$ 紙の長さとする。

【0023】したがって、予め紙サイズがわかっているれば、図1のフローチャートに示す如く、その長さ分の時間レジスト部で余分に待機することにより、最小紙間 L_3 で反転排紙から通常排紙の切り換えができる。なお、紙のサイズは一般的にカセットサイズ検知により知ることができる。

【0024】次に、図2は本発明の他の実施例を示すもので、上記実施例と同様な構成において、紙の後端がレジスト部を通過してからの経過時間を計測する手段を設け、次に排紙する紙を、1枚前の紙のレジスト部通過経過時間と記憶された紙サイズとの差分だけレジスト部で待機させる機能をもたせたものである。

【0025】この実施例では、後行紙のレジスト部到達が遅い場合、レジスト部での待ち時間は先行紙が通過した分短くてよいことに着目し、先行紙がレジスト部を通過してからの経過時間を測定し、この差分だけ待機させることにより、常に最短待ちを実現するものである。

【0026】又、図3は本発明の更に他の実施例を示すもので、図2の実施例と同様な構成において、紙がレジスト部を通過する時間を計測する手段と、計測された時間を保持する手段とを設け、予め長さを検知できない紙がレジスト部に到達したとき、前の紙の排紙面と上記紙のレジスト部通過時間と通過経過時間によってレジスト

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部で待機する時間を制御する機能をもたせたものである。

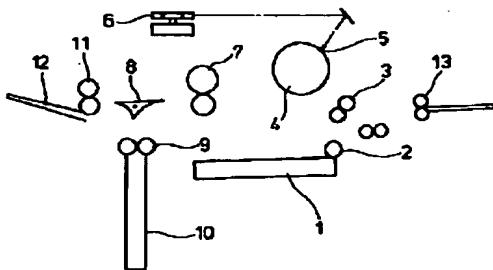
【0027】かかる実施例の場合には、手差し給紙のように、予め紙の長さがわからないときに、レジスト部を通過する時間を計測し、この時間を以下のタイミング計算に用いることで切り換えを最短時間で行うことができる。

【0028】なお、本発明は上記実施例のみに限定されるものではなく、本発明の要旨を逸脱しない範囲内において種々変更を加え得ることは勿論である。

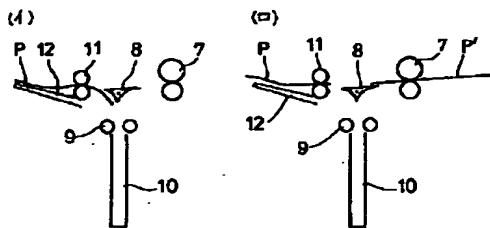
【0029】

【発明の効果】以上述べた如く、本発明のデジタル複写機の自動反転装置によれば、先行紙が反転排紙で後行紙が通常排紙のときに、記憶された先行紙の紙サイズに応じて後行紙をレジスト部で必要時間待機させる機能をもたせたので、切り換えのための時間を最短にすることで生産性向上を図ることができると共に、ジャムの発生をなくすことができ、又、後行紙のレジスト部到達が遅い場合には、先行紙のレジスト部通過経過時間と記憶された紙サイズとの差分だけ、後行紙をレジスト部に待機させることで最短待ちを実現でき、更に、手差し給紙の如き紙の長さがわからない場合には、レジスト部を通過する時間を計測し、これを基に後行紙を待機させることができる、等の優れた効果を発揮する。

【図4】



【図7】



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【図面の簡単な説明】

【図1】本発明のデジタル複写機の自動反転装置の一実施例を示すフローチャートである。

【図2】本発明の他の実施例を示すフローチャートである。

【図3】本発明の更に他の実施例を示すフローチャートである。

【図4】自動反転機能付デジタル複写機の給紙搬送機構の一例を示す概略図である。

【図5】通常排紙状態を示す概略図である。

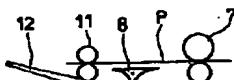
【図6】反転排紙状態を示すもので、(イ) (ロ) (ハ) (ニ) はそれぞれ異なる作動を示す概略図である。

【図7】反転から通常排紙へ移行する状態を示すもので、(イ) (ロ) はそれぞれ異なる作動を示す概略図である。

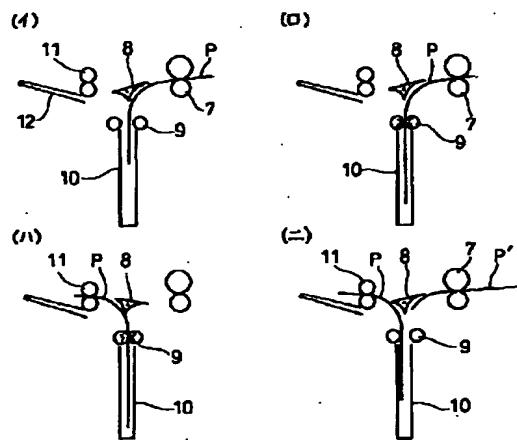
【符号の説明】

- 2 紙コロ
- 3 レジストローラー (レジスト部)
- 7 定着ローラー
- 8 反転切り換え爪
- 9 反転ローラー
- 10 反転ストッカー
- 11 排紙ローラー

【図5】



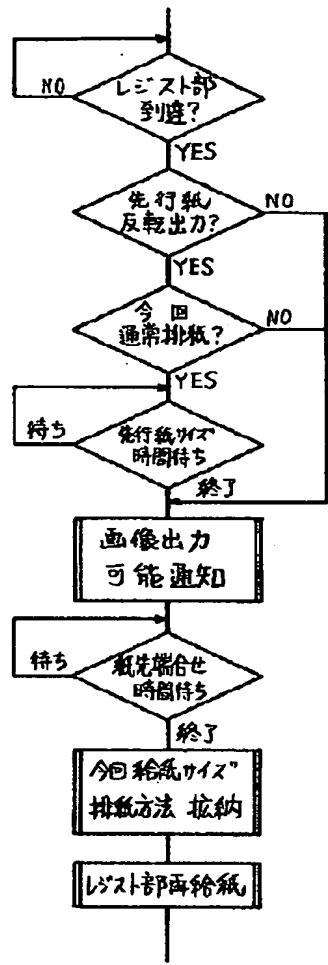
【図6】



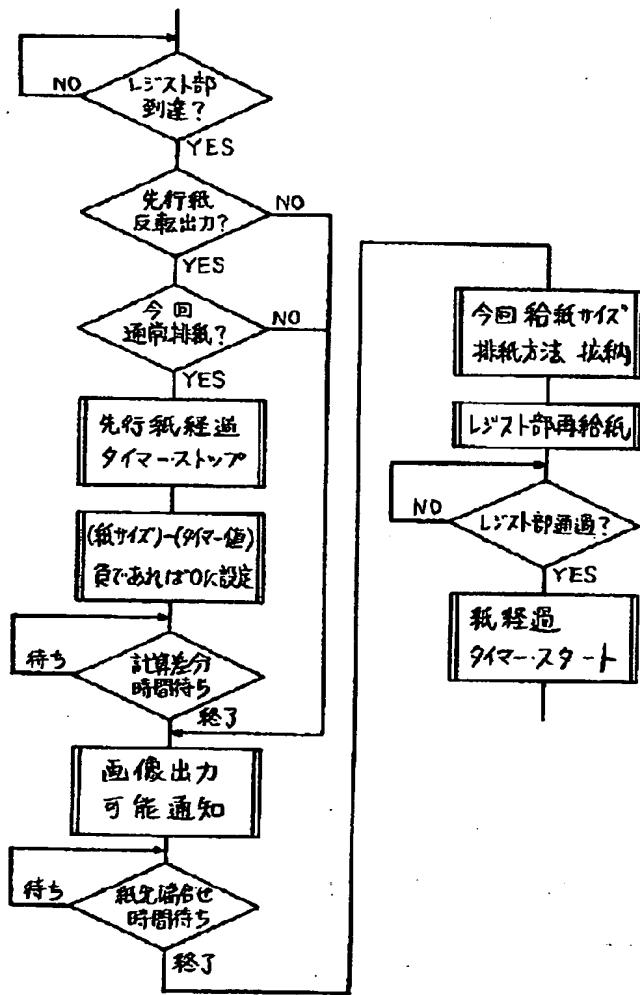
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【図1】



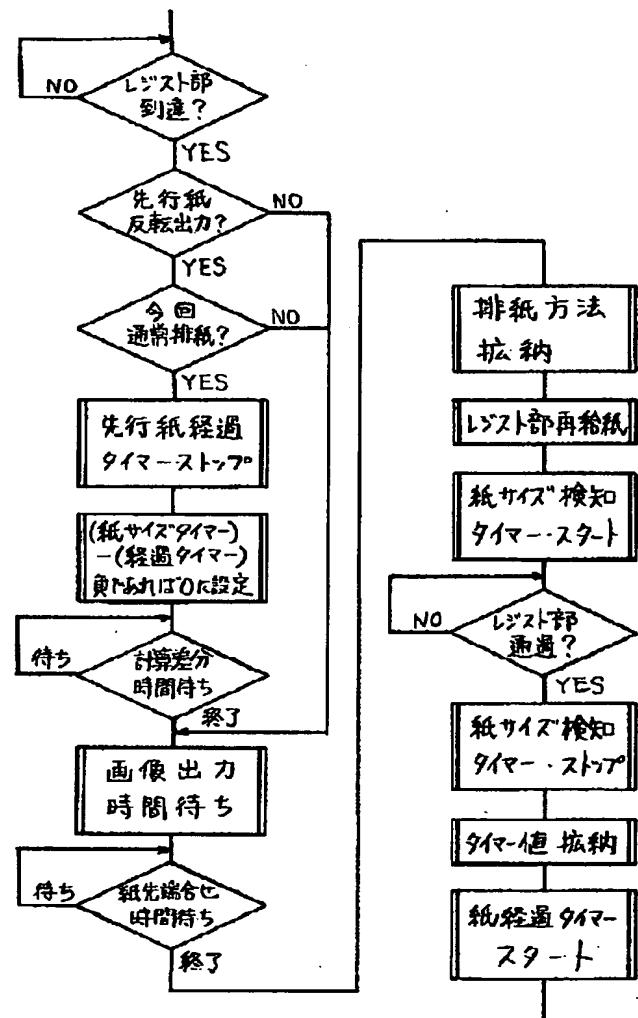
【図2】



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【図3】



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(71)Applicant : RICOH CO LTD

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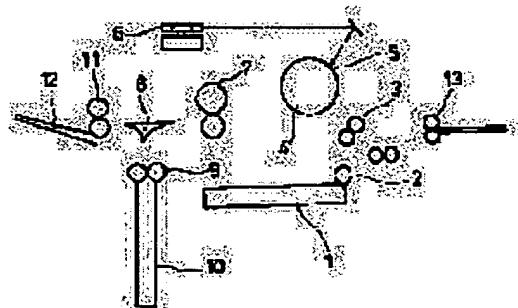
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(54) AUTOMATIC REVERSAL DEVICE FOR DIGITAL COPYING MACHINE

(57)Abstract:

PURPOSE: To shorten a selecting time and improve the workability by causing a trailing paper sheet to wait at a resist section for a necessary time, depending upon the size of a memorized leading paper sheet, when the leading paper sheet is delivered after reversal and the trailing paper sheet is normally delivered.

CONSTITUTION: A paper sheet transfer mechanism operates in such a way that a transfer paper sheet is taken out on the rotation of a feed roller 2, and caused to pass through a photoreceptor 4 and a fixing roller 7 on the rotation of a resist roller 3, upon receipt of request about image transfer. Then, the sheet is delivered in normal state to a stacking tray 12 via a delivery roller 11. In delivering a paper sheet in reversal state, a reversal selector claw 8 is actuated and a transfer paper sheet is temporarily introduced to a reversal stocker 10. Thereafter, a reversal roller 9 is reversed to deliver the sheet to the delivery roller 11 and, then, operation migrates to judgement and sheet delivery control mode. In this case, a control device operates to keep a paper sheet at the section of the resist roller 3 for a necessary time, depending upon the size of a memorized leading paper sheet, when the leading paper sheet is delivered in reversal state and a trailing paper sheet is delivered in normal state.



LEGAL STATUS

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CLAIMS

[Claim(s)]

[Claim 1] An automatic turnover device of a digital copier which can be made to carry out the selection delivery of the printed paper at a front face and the rear face with which it has the following and one-sheet before is characterized by giving a function to carry out need time amount maintenance of the paper delivered to a degree according to paper size when a degree was reversal-less delivery, before [one] memorizing at reversal delivery in the resist section. A means to memorize a field of paper to which paper is delivered one sheet ago A means to detect paper size beforehand A means to memorize paper size of one sheet ago

[Claim 2] An automatic turnover device of a digital copier according to claim 1 which gave a function in which only difference with paper size remembered to be the resist section passage elapsed time of paper of one sheet ago makes paper which establishes a means to measure elapsed time after the back end of paper passes the resist section, and is delivered to a degree stand by in the resist section.

[Claim 3] The automatic turnover device of a digital copier according to claim 2 which gave a function which controls by delivery side of front paper, resist section pass time of the above-mentioned paper, and passage elapsed time time amount which stands by in the resist section when paper in which paper establishes a means measure time amount which passes the resist section, and a means hold measured time amount, and cannot detect length beforehand reaches the resist section.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the automatic turnover device of a digital copier.

[0002]

[Description of the Prior Art] Although reversal[reversal/] -less delivery is determined by the operation mode and the decision differs in the copying machine which has an automatic inverting function by whether an automatic manuscript feed gear (ADF) is with a manuscript inverting function (RADF), or how the order of delivery of a manuscript is designed, it is necessary to deliver paper so that the sequence of the paper to which paper was delivered may generally become the same as the sequence of a manuscript.

[0003] Moreover, since it is common that delivery is stacked according to the sequence outputted first, rear-face delivery is required of a laser beam printer (LBP), but since it is unnecessary in an automatic inverting function if whether delivery is used as a front face or it is made a rear face correspond when a user switches a mechanism device, a actual top and almost all printers are switching by the mechanism method.

[0004] On the other hand, in the digital copier, the type which combined the printer with one has appeared, and when the output as a copying machine has common surface delivery and it switches to a printer function in this case, automatic reversal delivery equipment is prepared so that general rear-face delivery can be chosen.

[0005] However, in the conventional digital copier, in order to go into printer mode when it switches to printer mode from copy mode, and a break is attached in a series of actuation with copy mode (for example, the completion of delivery), switching time will be long and productivity will fall extremely.

[0006] the point [according / if it explains in full detail, drawing 4 shows an example of the feed conveyance device of a common digital copier with an automatic inverting function, and / 1 / 2 / a transfer paper cassette and / 5 / to the polygon write-in section 6 in the feed koro and 3 / exposing] according [a resist roller and 4] to a photo conductor, and 7 -- for a reversal roller and 10, as for a delivery roller and 12, a reversal stocker and 11 are [a fixing roller and 8 / a reversal switch pawl and 9 / a delivery saucer and 13] the feed koro for manual bypass. Moreover, each above-mentioned resist roller 3, the fixing roller 7, and the delivery roller 11 are equipped with the resist sensor, the fixation sensor, and the delivery sensor in order to control paper conveyance, respectively.

[0007] First, paper is fed to a transfer paper one sheet, it detects having reached the resist roller 3 by the resist sensor, and once suspends the resist roller 3 here, and paper is made to stand by by rotating the feed roller 2. Next, if a picture signal demand is advanced, the signal for forming an image in the exposing point 5 is inputted, and after only the difference of the distance from an exposing point to an imprinting point and the distance from the resist roller 3 to an imprinting point keeps the resist roller 3 waiting for paper, a resist roller restart will be performed. Thereby, the head and image head of paper are made in agreement. subsequently -- although the timing whose feeding is attained changes with the layout of a paper size machine etc. -- a minimum of -- since jam detection cannot be performed unless it sets the gap of dozens of mm or more -- this gap -- between [L1] papers It is referred to as (mm).

[0008] Since Paper P is now conveyed as it is in an automatic reversal machine as shown in drawing 5 when usually delivering paper, there should just be between the above-mentioned papers.

[0009] On the other hand, when carrying out reversal delivery, as shown in (b) of drawing 6 , first, the conveyance pass of Paper P is changed with the reversal switch pawl 8, and Paper P is led to the reversal stocker 10. At this time, the fixing roller 7 is performing paper conveyance and it controls to make paper conveyance perform on the reversal roller 9, just before Paper P escapes from a fixing roller 7, as shown in (b) of drawing 6 . Next, when Paper P escapes from a fixing roller 7 thoroughly, as shown to (Ha) of drawing 6 , counterrotation of the reversal roller 9 is carried out, and Paper P is led in the direction of the delivery roller 11 with the reversal switch pawl 8. Then, since the delivery roller 11

conveys precedence paper P after the head of the precedence paper P reaches the delivery roller 11 as shown in (d) of drawing 6, conveyance actuation with a reversal roller can be canceled and it can shift to reversal delivery control of following paper P'.

[0010] Between [L2] the papers in the case of carrying out continuation reversal here If it thinks, it will become a distance required for the process of (b) of drawing 6 - (d). time amount x paper bearer rate =L2 [namely,] until the back end of the precedence paper P passes a fixing roller 7, and the reversal roller 9 conveys precedence paper, it switches a hand of cut and it makes the head of precedence paper reach the delivery roller 11 it is .

[0011] Generally, it is the above-mentioned L1. L2 What was necessary was just to have carried out fixed control of between papers, when reversal delivery was usually delivered paper and carried out by continuation in order to design a mechanism device so that it may become equal. Therefore, after all delivery was usually completed conventionally, it had switched to reversal delivery. Moreover, the same is said of the reverse.

[0012]

[Problem(s) to be Solved by the Invention] However, by the conventional method, when operating a digital copier combining a printer function, since useless time amount arose whenever it switches delivery, productivity was falling.

[0013] If actuation of a reversal machine is considered well, when the delivery method of precedence paper and the paper (following backward paper) which stood by in the resist section this time is the same, it is L1 =L2 between the usual papers. Things mentioned above. Generally, since it is carried out in the feed control phase before reaching a resist roller between this paper, the usual resist processing should just perform the above-mentioned paper head doubling processing to the last. Moreover, when usually switching to reversal delivery from delivery, it is unnecessary in special processing similarly. It is L1 =L2 in this case to become a problem between the minimum papers by the case where it usually switches to delivery from reversal delivery. If paper is conveyed, since backward paper enters [precedence paper] during a reversal process at a reversal machine, a jam will be generated.

[0014] Then, this invention tends to enable it to lose the jam of precedence paper and backward paper while making useless time amount for a switch min by controlling the standby time in the resist section.

[0015]

[Means for Solving the Problem] In an automatic turnover device of a digital copier which can be made to carry out the selection delivery of the printed paper at a front face and the rear face in order that this invention may solve the above-mentioned technical problem Have a means to memorize a field of paper to which paper is delivered one sheet ago, a means to detect paper size beforehand, and a means to memorize paper size of one sheet ago, and by reversal delivery, when a degree is reversal-less delivery, one-sheet before It considers as a configuration which gave a function to carry out need time amount maintenance of the paper delivered to a degree according to paper size before [one] memorizing in the resist section.

[0016] Moreover, it is good to consider as a configuration which gave a function in which only difference with paper size remembered to be the resist section passage elapsed time of paper of one sheet ago makes paper which establishes a means to measure elapsed time after the back end of paper passes the resist section, and is delivered to a degree stand by in the resist section.

[0017] Furthermore, when the paper in which paper establishes a means measure time amount which passes the resist section, and a means hold measured time amount, and cannot detect length beforehand reaches the resist section, it is good to consider as the configuration which gave the function which controls by delivery side of front paper, resist section pass time of the above-mentioned paper, and passage elapsed time time amount which stands by in the resist section.

[0018]

[Function] Backward paper is made to carry out need time amount standby in the resist section according to the paper size of the precedence paper in which precedence paper was memorized by reversal delivery when backward paper was usually delivery.

[0019] Moreover, when resist section attainment of backward paper is slow, only difference with the paper size remembered to be the resist section pass time of precedence paper in backward paper can be made to stand by in the resist section.

[0020] Furthermore, when the paper which cannot carry out length detection reaches the resist section like a manual paper feed, backward paper can be made to stand by in the resist section by the delivery side of precedence paper, the resist section pass time of paper, and passage elapsed time.

[0021]

[Example] Hereafter, the example of this invention is explained with reference to a drawing. In the same configuration as the digital copier which drawing 1 shows one example of this invention, and is shown in drawing 4 thru/or drawing 7

Have a means to memorize the field of the paper to which paper is delivered one sheet ago, a means to detect paper size beforehand, and a means to memorize the paper size of one sheet ago, and by reversal delivery, when a degree is reversal-less delivery, one-sheet before the paper delivered to a degree according to the paper size before [one] memorizing -- the resist section -- between [L3] the minimum papers only -- the function to make it stand by is given. [0022] When it explains in full detail, it is between [L2] papers from (b) of drawing 6 - (d). Although determined, the timing earliest although a reversal machine is reached without backward paper raising a jam is the timing to which the head of backward paper P' arrives at immediately after at a fixing roller 7 after reversal delivery, just before the back end of the precedence paper P passes the delivery roller 11, as shown in (b) of drawing 7. On the other hand, it is difference L3-L2 in (d) of drawing 6, and (b) of drawing 7. It turns out that it is the length of paper mostly. Although some differences naturally come out according to a mechanism's layout, of course, since these errors are not directly related to explanation, let them be the length of L3-L2 = paper as central value.

[0023] Therefore, it is between [L3] the minimum papers by standing by in an excess in the time amount resist section for the length, as shown in the flow chart of drawing 1 if paper size is known beforehand. A switch of delivery can usually be performed from reversal delivery. In addition, generally the size of paper can be known by cassette size detection.

[0024] Next, drawing 2 shows other examples of this invention, establishes a means to measure the elapsed time after the back end of paper passes the resist section in the same configuration as the above-mentioned example, and gives the function in which only difference with the paper size remembered to be the resist section passage elapsed time of the paper of one sheet ago makes the paper delivered to a degree stand by in the resist section.

[0025] the part to which precedence paper passed the latency time in the resist section in this example when resist section attainment of backward paper was slow -- waiting for the shortest is always realized by measuring the elapsed time after precedence paper passes the resist section paying attention to being short, and making only this difference stand by.

[0026] Moreover, drawing 3 shows the example of further others of this invention, and sets it in the same configuration as the example of drawing 2. When the paper in which paper establishes a means to measure the time amount which passes the resist section, and a means to hold the measured time amount, and cannot detect length beforehand reaches the resist section, The function which controls by the delivery side of front paper, the resist section pass time of the above-mentioned paper, and passage elapsed time the time amount which stands by in the resist section is given.

[0027] Like a manual paper feed, when the length of paper is not known beforehand, in the case of this example, the time amount which passes the resist section can be measured, and it can switch to it by the shortest time amount by using this time amount for the following timing count.

[0028] In addition, as for this invention, it is needless to say that modification can be variously added within limits which are not limited only to the above-mentioned example and do not deviate from the summary of this invention.

[0029]

[Effect of the Invention] Since precedence paper gave the function in which it carries out the need time amount standby of the backward paper in the resist section according to the paper size of the memorized precedence paper when backward paper is usually delivery, by reversal delivery according to the automatic turnover device of the digital copier of this invention as stated above Generating of a jam can be abolished, while being able to make time amount for a switch into the shortest and being able to plan a productivity drive. When resist section attainment of backward paper is slow Only difference with the paper size remembered to be the resist section passage elapsed time of precedence paper The waiting for the shortest is realizable by making backward paper stand by in the resist section, and further, when the length of the paper like a manual paper feed is not known, the effect which the time amount which passes the resist section can be measured [effect] and can make backward paper stand by based on this and which was excellent in ** is demonstrated.

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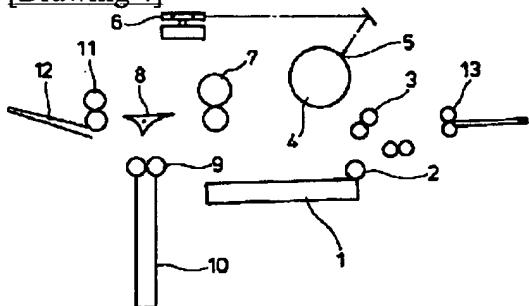
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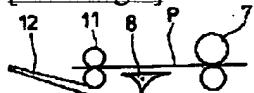
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DRAWINGS

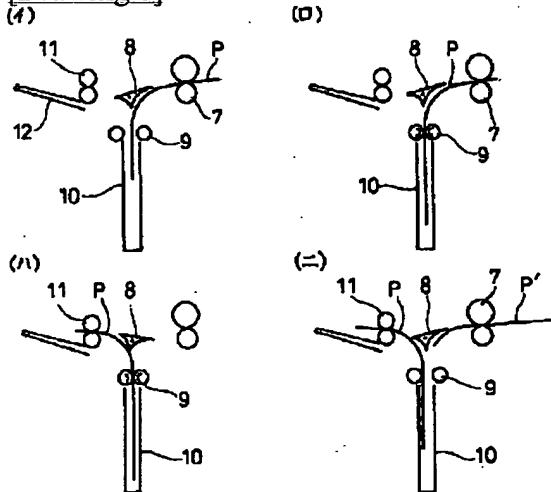
[Drawing 4]



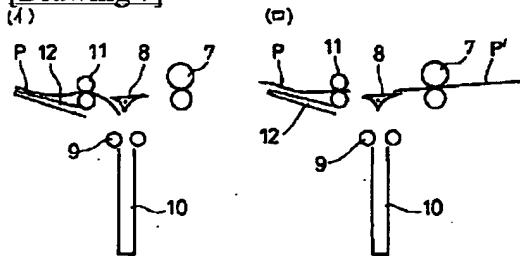
[Drawing 5]



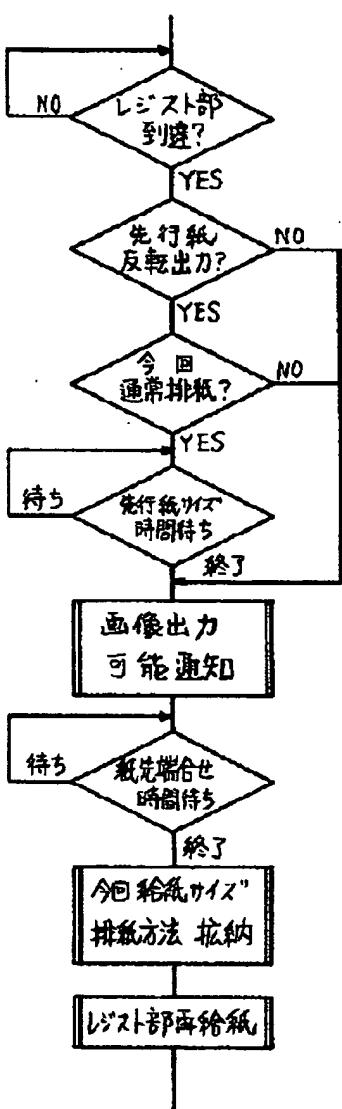
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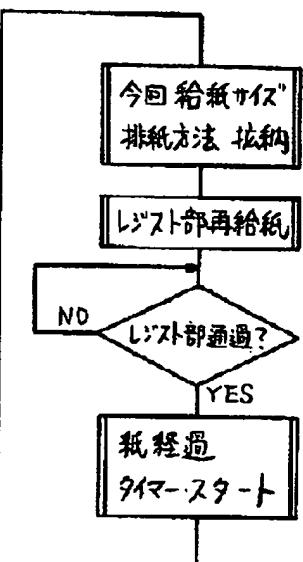
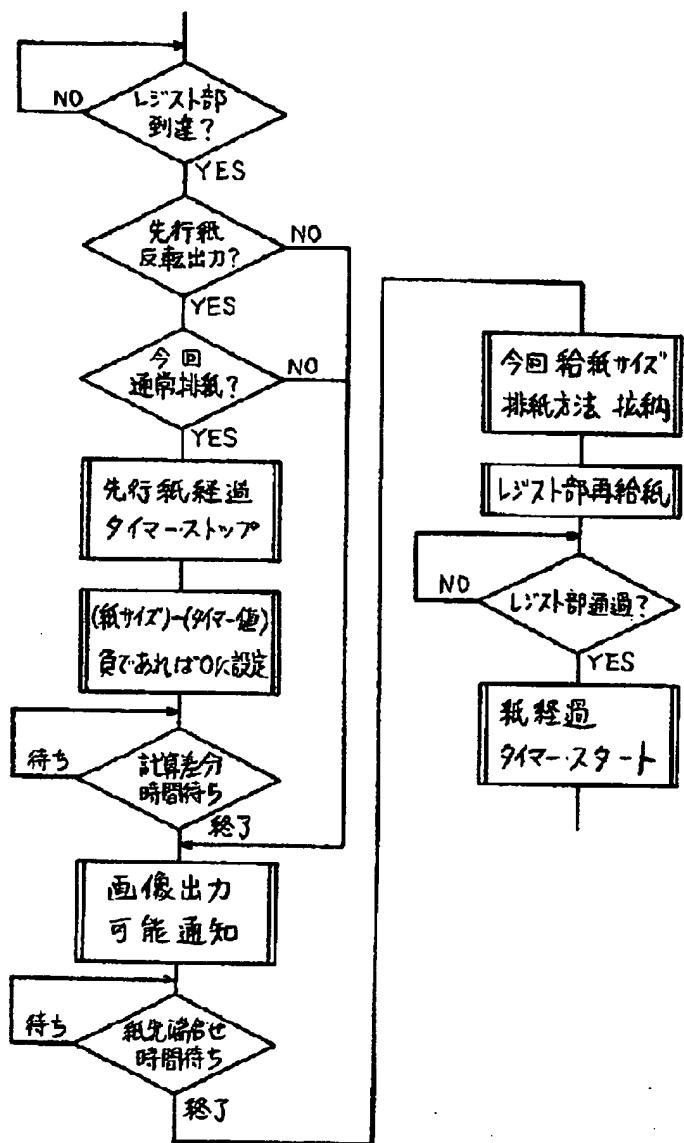
[Drawing 7]



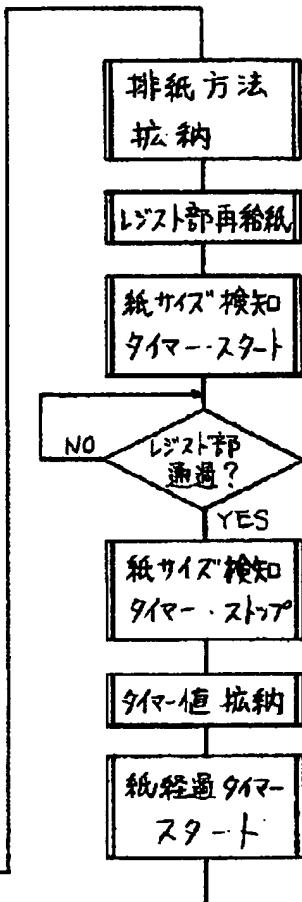
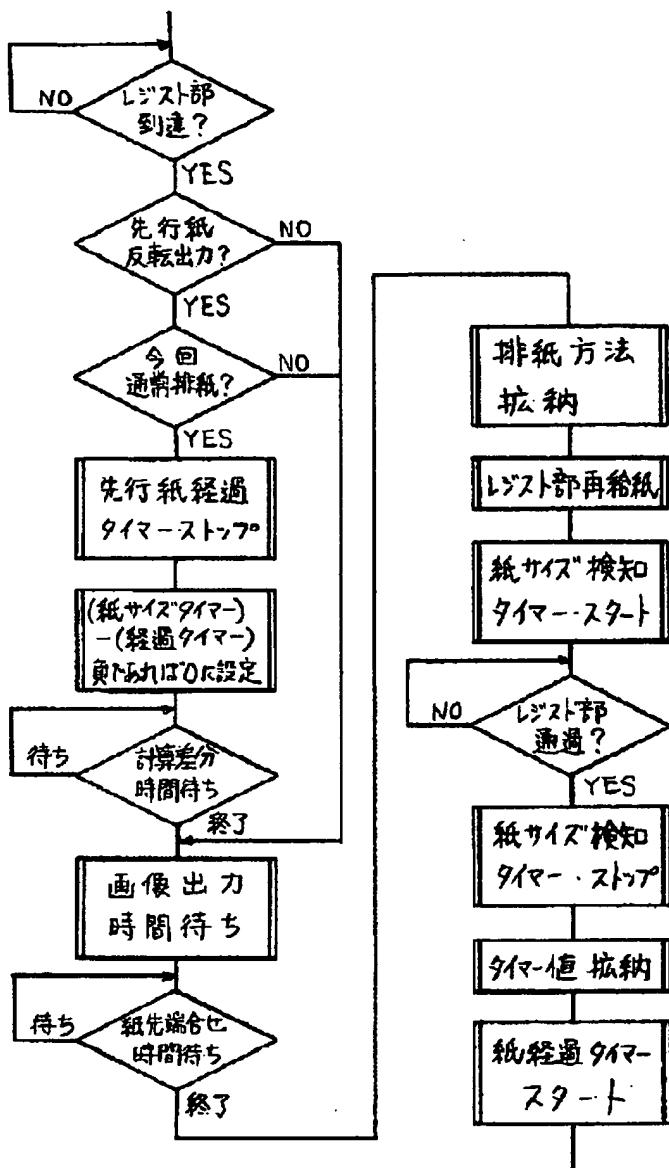
[Drawing 1]



[Drawing 2]



[Drawing 3]



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